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An Estimate of the Cost of Establishing A School of Dentistry In Oklahoma

U. S. DEPARTMENT OF HEALTH, EDUCATION AND WELFARE
Office of Education

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Submitted to

The Twenty-Ninth Oklahoma Legislature
in Compliance with Section 6, House Bill 829,
Twenty-Eighth Oklahoma Legislature

By

The Oklahoma State Regents for Higher Education
State Capitol, Oklahoma City

January, 1963

ED000880

OKLAHOMA STATE REGENTS
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Research Assistant

Dear Friend:

At the request of the 1961 Session of the Oklahoma Legislature, the Oklahoma State Regents for Higher Education prepared this report on estimated costs of establishing a dental school in Oklahoma.

On behalf of the State Regents I am pleased to send you this copy and I hope you may find it informative.

E. T. Dunlap
Chancellor

AN ESTIMATE OF

THE COST OF ESTABLISHING A SCHOOL OF DENTISTRY

ON THE CAMPUS OF THE UNIVERSITY OF OKLAHOMA SCHOOL OF MEDICINE

Submitted to

The Twenty-Ninth Oklahoma Legislature
in Compliance with Section 6, House Bill 829,
Twenty-Eighth Oklahoma Legislature

By

The Oklahoma State Regents for Higher Education
State Capitol, Oklahoma City

January 1963

OKLAHOMA STATE REGENTS FOR HIGHER EDUCATION
State Capitol, Oklahoma City

LETTER OF TRANSMITTAL

To The Honorable Members of the
Twenty-Ninth Oklahoma Legislature

Gentlemen:

The Twenty-Eighth Oklahoma Legislature, in Section 6, House Bill 829, requested the Oklahoma State Regents for Higher Education to make a study of the costs of establishing a school of dentistry in conjunction with the University of Oklahoma School of Medicine.

In compliance with this request, the State Regents have made the study and the report is presented herewith.

Respectfully submitted,

G. Ellis Gable
Chairman

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Part I

BACKGROUND OF THE STUDY

The Twenty-Eighth Oklahoma Legislature enacted House Bill 829 authorizing the establishment of a school of dentistry to be located upon the existing Oklahoma City campus of the University of Oklahoma School of Medicine. Section 6 of this Bill provides:

> It is the intent of the Legislature that the Board of Regents of Higher Education shall make a study and prepare a comprehensive plan for the initiation of the School of Dentistry and present the same to the Twenty-Ninth (29th) Session of the Oklahoma Legislature, together with estimates of cost; provided, that the enactment of this Act shall not be deemed or understood to be a commitment of the Legislature for the future appropriation of monies to implement such plan.[1]

The Oklahoma State Regents for Higher Education in regular meeting on October 23, 1961 directed their staff to gather information and do other research necessary to comply with the legislative request. This report of the study outlines the estimate of costs of providing the buildings and equipment as well as the initial operating funds for establishment of the dental school.

It might be well to point out that this study does not include research relating to Oklahoma's need for a dental school or justification for the establishment of

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[1]Section 6, House Bill No. 829, Twenty-Eighth Oklahoma Legislature.

one; nor does it explore the various alternatives for meeting the dental manpower needs in Oklahoma in the years ahead.

At the request of the Twenty-Eighth Oklahoma Legislature (contained in Section 5, House Bill 553), the Oklahoma State Regents for Higher Education are now engaged in a comprehensive study of all Oklahoma higher education. This is a two-year project and includes broad and intensive study in seven problem areas, namely: (1) functions and goals of Oklahoma higher education; (2) control and administration; (3) higher education enrollments and projections; (4) higher education opportunities and needs; (5) selecting, retaining, and utilizing faculties and administrative personnel; (6) physical facilities for higher education; and (7) financing current operating costs of higher education in Oklahoma. This comprehensive study is being conducted in two parts or phases, the first of which includes problem areas three, five, and seven relating to student enrollments, faculty, and financing higher education operating costs. The first phase is scheduled for completion by January, 1963.

The second phase of the comprehensive study includes problem areas one, two, four, and six. Problem area four, higher education opportunities and needs, will encompass a study of the scope of educational opportunities available in Oklahoma and programs not now available but which possibly are needed, including dental education. Information presented to the State Regents previously by the Oklahoma Dental Association and other agencies indicates a need for more dentists for our state. This suggests the need for thorough study of the problem by the State Regents, which further study will include:

1. Analysis of Oklahoma's present dental manpower resources and projection of future dental manpower requirements.

2. Feasibility of supplying Oklahoma's future dental manpower requirements through Southern Regional Education Board contracts with dental schools in other states in the Compact.

3. Estimate of the cost of building and operating a dental college in Oklahoma in connection with the University of Oklahoma School of Medicine.

4. Study of various other alternatives that might be used to supply future Oklahoma dental manpower needs, and the relative merits and limitations of each.

A report of the findings of the study of the state's dental education needs along with a comprehensive review of all educational needs beyond the high school for Oklahoma will be forthcoming during the latter part of the year 1963.

For this report it of course was necessary for the State Regents to assume that if a dental school is established, its program should be a standard four-year program and cost estimates are on this basis. It therefore appears that the report of the study contained herein is perhaps as comprehensive as was possible to accomplish at this preliminary stage. Should a decision be made to move forward with plans for establishing the dental school, with appropriations being provided accordingly, the State Regents and the governing board for the school would of course then consider in more comprehensive detail plans for implementing the policy decision.

Limitations

Attention is directed to several factors with regard to interpreting and making use of this report. It has been necessary to base cost estimates on a series of

assumptions with regard to availability of land and physical facilities, size of the school, curriculum, building costs, and operating needs. While the assumptions are reasonable, modification or change of any one factor obviously may substantially change the cost estimates presented herein.

This report does not recommend for or against the establishment of a School of Dentistry in Oklahoma. Following completion of the comprehensive self-study of Oklahoma higher education, the State Regents will present their recommendations regarding gaps in the state's system of higher education and steps which should be taken to bridge them.

Variations in local building codes, land and labor costs, building materials, and dental programs to be provided can greatly affect actual construction costs. In preparing this report, data were obtained from three states (California, Colorado, and Kentucky) that are currently planning or have recently constructed new dental schools. However, unique circumstances were noted in each of these situations which precluded the direct application of these data to the Oklahoma situation. Therefore, major reliance was placed upon cost data provided by the United States Public Health Service.

A second factor that can greatly affect construction costs is the size of the dental school that is built. In this report the enrollment figures used for planning purposes have been based on an analysis of the number of Oklahoma students enrolled in dental colleges outside the state during the 1961-62 school year. A more thorough study of many factors related to enrollment--such as out-of-state enrollments that might be expected, increased demand for dental education resulting from

greater availability of opportunities, and dental manpower needs in Oklahoma--should precede the decision regarding the actual size of the facilities to be constructed.

Assumptions regarding faculty needs have been based on data obtained from dental colleges in other states. It is quite possible that a dental college operated at the medical center might make some use of the medical school faculty, particularly in the teaching of the basic sciences. At this stage it has not been possible to determine the extent to which the medical school faculty might be drawn upon to teach classes in the dental school, if any.

An analysis of the utilization and availability of classroom and laboratory space at the School of Medicine likewise has not yet been accomplished. It is possible that cost estimates of classroom and laboratory facilities for a school of dentistry reported herein might be reduced by sharing certain facilities with the School of Medicine. Again, at this stage though, it must be assumed that additional physical facilities will be needed to house the complete dental school program.

From conferences with administrators of the University of Oklahoma School of Medicine, impressions have been gained to the effect that both staff and ~~faculty~~ facility resources presently available at the School of Medicine are being utilized to their maximum in support of the medical education program. Also, it is believed that additional land must be provided for extending the present site of the School of Medicine in order to provide for an adequate site for a school of dentistry. There is, however, no way at this time to arrive at a valid estimate of

the cost of the land since the specific site and the amout of acreage needed cannot be appropriately determined. Therefore, it has been necessary to assume that the site for a dental school would be provided outside the estimates contained in this report.

Part II

ASSUMPTIONS UNDERLYING THE STUDY

As has already been pointed out, it has been necessary to make a series of assumptions in order to develop a plan and arrive at a reasonable estimate of the cost of establishing a school of dentistry in connection with the University of Oklahoma School of Medicine. Following are the basic assumptions that have been made and a brief statement of the reasons underlying the adoption of each. The use of these assumptions need not restrict or limit the usefulness of this report, for cost estimates can be modified to fit new or revised plans as more detailed studies are made.

1. It is assumed that the school of dentistry shall be located upon the existing Oklahoma City campus of the University of Oklahoma School of Medicine.

House Bill 829 expressly provided that the State Regents' study be based on the cost of establishing a school of dentistry in conjunction with the University of Oklahoma School of Medicine. This proposal reflects the approach that has been taken in many states that have dental schools. Also, it is important for accreditation that a dental education program be under university auspices and not conducted as a business enterprise.[2]

[2]Council on Dental Education, "Requirements for the Approval of a Dental School," American Dental Association, mimeographed regulations.

2. It is assumed that the present faculty and physical facilities at the University of Oklahoma School of Medicine are being used to their utmost and therefore additional faculty and facilities will be needed in order to provide for the school of dentistry.

Only a careful study of the staffing patterns, faculty work load, and facilities of the School of Medicine will enable a determination to be made as to the extent to which facilities and manpower resources are presently available to service a portion of a new dental school. If the University of Oklahoma School of Medicine is typical of those across the nation, it likely is understaffed and inadequate with respect to facilities. The establishment of a new school that further drains the resources of an existing school will not only create poor inter-discipline relations but also can do considerable harm to the quality of both programs.

In the absence of a careful study of the utilization of faculty and facilities at the University of Oklahoma School of Medicine, it has been assumed that complete facilities will be needed for the school of dentistry. It is also assumed at this preliminary stage that the general administration of the school of dentistry will be independent of the School of Medicine.

3. It is assumed that the curriculum and physical facilities of the dental school will be sufficient to meet the requirements for accreditation by the Council on Dental Education of the American Dental Association.

In order to be accredited by the Council on Dental Education, a school of dentistry must meet minimum requirements with regard to financial management and support, physical plant, library, faculty, curriculum, and admission

standards. It is presumed that should the state decide to establish a school of dentistry it would seek to establish and maintain an accredited program.

4. It is assumed that the entering freshman class at the School of Dentistry should accommodate an enrollment of 60 students.

According to the 1961-62 Dental Students' Register, there were 189 Oklahoma students enrolled in dental colleges outside Oklahoma during the school year.[3] This figure does not include enrollments in auxiliary programs such as dental hygiene and dental laboratory technician programs. This same report indicates that for every 100 entering freshmen dental students, approximately 90 students survive to graduation.

An entering freshman class of 60 students will provide a total dental school enrollment of about 228 students, assuming attrition rates in the Oklahoma dental school program would approximate the average attrition of all dental schools across the nation. A dental school of this size would accommodate an enrollment equal to all Oklahoma students who are presently seeking dental education opportunities elsewhere as well as provide for some additional students in the future. It is reasonable to assume that the demand for dental education will rise rapidly as such educational opportunities become more accessible and less expensive to the student. In addition, because dental education opportunities are presently limited, there would likely be many applicants for admission from those states that

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[3]American Dental Association, Dental Students' Register, 1961-62, 222 East Superior Street, Chicago.

presently do not have a dental college. Therefore, the figure of 60 freshmen students probably should be the minimum planning figure.

5. It is assumed that space requirements as well as costs for building and equipment will approximate those findings reported by the United States Public Health Service in a recent nation-wide study of dental schools.

In December of 1961, the United States Department of Health, Education and Welfare, Division of Dental Public Health and Resources, published a comprehensive study which recommends space allocations for dental schools.[4] This guide brings together a variety of information on trends in dental education, space utilization and allocation, site selection and construction costs as reported by the deans of all the nation's dental schools. That study provided the basis for estimates on space needs and construction costs used in this report.

6. It is assumed that per-student operating costs will approximate those of publicly supported schools of dentistry across the nation.

Operating cost estimates used in this report were based on the 1961 Survey on Financial Aid for Dental Education, conducted by the Council on Dental Education of the American Dental Association.[5] This study found that during the 1959-60

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[4]Public Health Service, Dental School Planning, U.S. Department of Health, Education and Welfare, Division of Public Health and Resources, Publication No. 940, Washington 25, D. C., p. 19.

[5]Ruth Dee Bothwell, Summary Report of the 1961 Survey on Financial Aid for Dental Education, Manpower and Education Branch, Division of Dental Public Health and Resources, United States Public Health Service.

fiscal year, the per-student cost at nineteen publicly supported dental schools was $3,415. Of this amount, $549 came from tuition and fees. The remainder of costs not covered by students ($2,866) came from legislative appropriations, sales and services of clinics, gifts and grants, and inter-state contracts for the acceptance of non-resident students. While these data are three years old, they are the latest available statistics on current operating costs. These figures were increased by a conservative 15 per cent in anticipation of increased per-student operating costs, based on the trend in dental school operating costs reported by the Council on Dental Education.

7. It is assumed that a dental program will be organized and provided which will enable an Oklahoma student to complete the requirements for a D.D.S. degree. In the immediate future graduate or postgraduate education in dentistry will not be provided.

A variety of alternatives exist with respect to the scope and depth of dental programs that might be provided by a new dental school. One alternative, for example, might be the establishment of a 2-year dental program with the last two years obtained at a dental school outside Oklahoma. Another alternative might include the establishment of graduate and postgraduate curricula. Still another might include the establishment of a variety of auxiliary programs such as the Dental Hygienist Program (2-year) and the Dental Assistant Program (1-year).

Since the merits of these alternatives have not yet been fully explored, cost estimates herein have been based on the assumption that only the 4-year dental education program will be established and operated. If other programs are added,

or if a dental program of less than four years were to be offered, cost estimates in this report would need to be modified accordingly.

8. It is assumed that the dental program will be "phased in" over a 4-year period of time.

It is assumed that the enrollment during the first year of operation would include only the 60 entering freshmen; the second year it would include the surviving sophomores plus a new freshman class of 60 students; the third year it would include those who survive to the junior year plus those in the second entering class who survive to the sophomore year, and a third entering class of 60 students. The fourth year and thereafter, the dental school would presumably operate at full capacity.

9. It is assumed that land will be made available to accommodate such physical facilities as will be needed to provide for the new dental school.

The amount of land that may be needed for a building site will depend upon a number of variable factors. If multi-story buildings are planned, less land will be required than if single or two-story buildings are constructed. Other variables include decisions with respect to the amount of student housing to be provided, parking space needs, orientation of the dental school complex in relation to the existing medical school, and future plans for the expansion of the medical school program.

Because these questions cannot be resolved without considerable study and research, it has been assumed for estimating purposes that land will be made available to provide for the dental school building site. If additional land must be acquired, the cost of obtaining title and improving the site must be added to cost estimates herein.

10. It is assumed that the student fees charged resident students would be $500 per academic year.

During the 1959-60 academic year, the average income from student tuition and fees in the 19 state-supported dental schools in the United States was $549. This figure includes income from charges made of both resident and non-resident students in these institutions.

It has been assumed in this report that student fees charged resident students in the dental program would be $500 per academic year. This is the amount of student fees currently charged resident students by the University of Oklahoma School of Medicine. No revenue from out-of-state enrollment has been projected.

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Part III

ESTIMATED COSTS OF BUILDING AND EQUIPMENT

The planning of a dental college involves far more than the employment of architects and engineers to prepare designs and specifications. A great many activities must precede even the drawing of preliminary sketches if the buildings are to be both functional and economically sound.

Ideally, the planning of a new dental college should begin with the employment of the administrative staff and department heads. These individuals should be charged with the responsibility of developing a program which spells out the school's purposes and objectives, the basic and ancillary programs and services to be provided, various teaching methods that will be employed, and the number of students to be accommodated. With this written program in hand, the architect could then develop preliminary plans that will accommodate the educational program to be carried on in the new school.

The ideal approach obviously was not possible in preparing this report. Since it was necessary to base cost estimates upon the programs and services to be provided, secondary sources and resources were used to identify those programs and services that might logically be provided by a new dental school. While the programs, courses, and teaching methods identified in this manner are not

sufficiently precise or detailed for an architect, they do provide a logical basis for arriving at fairly reliable cost estimates.

Programs to be Provided

It has already been pointed out that cost estimates herein are based upon the assumption that facilities would be provided to house only the undergraduate program, and that in the immediate future graduate or postgraduate programs would not be provided. A careful review was made of the undergraduate curriculums of 15 accredited dental colleges across the nation for the purpose of determining the subjects typically offered. A study was also made of the minimum predental and professional requirements prescribed by the Council on Dental Education. From these analyses there was developed a list of professional subjects normally found in the undergraduate dental school curriculum. These subjects, normally grouped into two areas of instruction, are as follows:

Basic Sciences (preclinical)		Clinical Sciences	
Anatomy	Microbiology	Chronically Ill	Oral Surgery
Anesthesia	Pathology	Crown & Bridge	Orthodontics
Bacteriology	Pharmacology	Diagnosis	Pedodontics
Biochemistry	Physiology	Endodontics	Periodontics
Histology		Operative Dentistry	Prosthetics
Hygiene		Oral Medicine	Radiology

An organizational question currently unresolved by dental educators is whether the dental school should have its own basic science division or whether it should make use of the basic science division of another school or college within the university--usually the medical school. While considerable savings, both in

facilities and manpower, probably can be achieved by sharing the basic science division with another school, dental educators, if given a choice in the administrative pattern for a new school, generally recommend that dental schools contain their own basic science departments. In this report it has been assumed that the new dental school would contain its own basic science division.

The dental student's time is divided between classroom instruction on the one hand, and laboratory and clinical experience and practice on the other. Although methods of teaching vary, the dental student generally spends about one-half of his school day during his freshman and sophomore years attending lectures and conducting experiments in the basic science departments. The second half of his day is spent in the preclinical dental science laboratories practicing basic skills of dental treatment. In his junior and senior years, the student spends most of his time in the school clinics where, under the close supervision of his instructors, he becomes proficient in diagnosing and treating patients with various oral diseases and disorders.

The extensive use of laboratory and clinic areas in teaching the courses in the dental curriculum requires the student to stand and move about in performing experiments and practicing the skills being acquired. Considerable equipment, both stationary and movable, are required in laboratories, demonstration areas, and clinics. Both of these factors require that a considerably greater amount of floor space be provided for the dental program than for more conventional fields of instruction.

The Site

Where land costs are favorable and where parking facilities are to be provided, a building site covering a minimum of 10 to 12 acres is considered advisable.[6] A smaller site is feasible provided multi-story buildings are constructed to provide the necessary floor space. It should be of sufficient size, however, to permit later expansion.

Earlier in this report it was pointed out that the assumption had been made that the new dental school would be located upon the existing Oklahoma City campus of the University of Oklahoma School of Medicine, and that land is presently available for the dental school site. As was stated previously, if additional land must be acquired to accommodate part or all of the new dental school the cost of acquiring and clearing it must be added to construction estimates contained herein.

Space Needs and Estimated Costs

A recent report prepared by the Public Health Service in cooperation with the American Association of Dental Schools and the Council on Dental Education of the American Dental Association presents detailed space descriptions and space allocation tables for new dental schools, and estimates of construction costs for schools of various sizes.[7] These tables provide a reasonably realistic method of

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[6]Public Health Service, Dental School Planning, U. S. Department of Health, Education and Welfare, Division of Dental Public Health and Resources, Publication No. 940, Washington 25, D. C., p. 19.

[7]Ibid., pp. 89-109.

projecting the amount of square feet of space needed and the approximate cost of constructing dental school facilities.

There are two methods commonly used to estimate space allowances for dental school facilities. These are: (1) the amount of space needed per student; and (2) the amount of space needed per entering class. Regardless of which method is chosen, space allowances are frequently expressed in terms of modular units; i.e., the amount of space required to teach a given number of students. Since units of 16 make for easy planning, space allowances for dental facilities are commonly expressed in terms of multiples of 16-student modules. Thus, the space allowance tables presented in the publication, Dental School Planning, are for schools with entering dental classes of 48, 64, 80, 96, and 112 students. While such space estimates are rough, they are sufficiently precise to enable reasonable estimates of space needs and construction costs to be made.

In this report it was assumed that the entering freshman class would be 60 students each academic year; therefore, it was necessary to interpolate in arriving at the following estimates of net (usable) square feet of space required for a new dental school.

Type of Area	Net Sq. Ft.
Basic Science Facilities . . . . . (Teaching laboratories & ancillary facilities, special laboratory facilities, research areas, & related faculty offices)	35,950

Preclinical and Clinical Facilities . . . . . (Operatories, demonstration operatories, waiting rooms, clinic reception, sterilization, supply, medicine storage, recovery area, laboratories, & related faculty offices)	57,760
General Supporting Facilities . . . . . (Administration, lecture rooms, library, general maintenance & building service, animal quarters, technical shops, & special facilities for students and faculty)	39,290
Total Net Square Feet	133,000

In order to obtain 133,000 square feet of net (usable) floor space, it is necessary to construct facilities with a substantially greater amount of gross square feet. Even in a well-engineered dental school building, approximately 35 per cent of the gross area must be used for corridors, mechanical facilities, closets, walls, bathrooms, and the like. Thus, using the interpolated figure of 133,000 net square feet and estimating that only 65 per cent of the gross area is usable for instructional purposes, it would be necessary to construct a building or buildings with approximately 200,000 gross square feet.

Data presented in the Dental School Planning study indicate that construction costs across the nation vary from $20 to nearly $45 per square foot. These wide variations are due to such factors as differences in type of construction, labor and material costs, efficiency of the contractor, and timing of the bid-letting. The average cost in 1961 was estimated to be $30 per gross square foot. This figure does not include the purchase of a site or site improvement, cost of equipment, or planning services. Using the $30 per square foot cost figure, the cost of a dental

school to accommodate an entering freshman class of 60 students (and a total student body of approximately 228) would be $6,000,000.

Equipment costs also fluctuate drastically due to changes in design as well as the development of new equipment. For this reason, the fluctuation allowance for equipment should be even more generous than for construction. The Dental School Planning manual suggests that 30 per cent of the construction cost be allowed to provide for equipment and furniture.[8] Thus, a reasonable estimate for these items would be $1,800,000. The total estimated cost for buildings and equipment (exclusive of site and planning services) can be expected to be approximately $7,800,000.

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[8] Ibid., pp. 15-16.

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Part IV

ESTIMATED CURRENT OPERATING COSTS

In 1961, the Manpower and Education Branch of the Division of Dental Public Health and Resources, United States Public Health Service, conducted a nationwide survey of financial aid for dental education.[9] That report presents data on total and per-student costs in 19 public and 28 private dental colleges for the 1959-60 fiscal year. While these data are more than three years old, they are the latest available statistics on which to base estimated operating costs for an Oklahoma dental school. The high, low, and average per-student costs at the 19 public schools for the 1959-60 fiscal year were as follows:[10]

High	$7,902
Average	3,415
Low	1,442

The above per-student costs include the estimated value of services provided the dental schools by parent universities, medical schools and others. They do not include current funds from sponsors of specific programs within the school, chiefly research programs sponsored by federal grants.

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[9] Ruth Dee Bothwell, "Summary Report of the 1961 Survey on Financial Aid for Dental Education," (Mimeographed), Manpower and Education Branch, Division of Dental Public Health, United States Public Health Service.

[10] Ibid., p. 22.

It has been assumed in this report that the dental program will be phased in over a four year period, with the first and each subsequent freshman class enrolling 60 students. It also has been assumed that the proposed new dental school would experience attrition rates similar to those of other dental schools across the nation. On the basis of these assumptions, undergraduate dental school enrollments for each of the first four years would be approximately as follows:

	Freshman	Sophomore	Junior	Senior	Total
1st Year	60	-	-	-	60
2nd Year	60	58	-	-	118
3rd Year	60	58	56	-	174
4th Year	60	58	56	54	228

Bothwell reported that per-student costs for 19 state-assisted dental schools for the 1959-60 fiscal year amounted to $3,415. These costs, which exclude expenditures for sponsored programs, were covered by income from the following sources.[11]

Student tuition and fees	$ 549
Clinics	512
Gifts, grants & endowments	22
Other (includes legislative appropriations & indirect support)	2,332
Total	$3,415

[11] Ibid., p. 22.

It should be kept in mind that the above figures include the estimated value of services provided these 19 dental schools by the parent universities which are chargeable to the operation of the dental program but are not reflected in the dental school budgets. The value of these services was estimated by dental schools to be about $650 per student. However, the per-student cost of $3,415 does not reflect the cost of sponsored programs. These programs are nearly always tailored to the interest of the sponsoring agencies, and funds are usually restricted to carrying out the terms of these programs and are not available for support of the regular educational program. If such funds were included, per-student costs would be $3,881.

Following is the projected annual cost of operating a dental college. Column (a) estimates are based on the assumption that per-student costs will approximate the 1959-60 average per-student costs in 19 public dental colleges across the nation, exclusive of sponsored programs. Column (b) estimates are based on the conservative assumption that per-student costs will exceed the 1959-60 average by 15 per cent.

	Projected Enrollment	Estimated Operating Budget (a)	(b)
1st year	60	$205,000	$235,000
2nd year	118	403,000	463,000
3rd year	174	594,000	683,000
4th year	228	779,000	895,000

In a recent study of the source of income for all state-assisted dental schools across the nation, the following breakdown was reported:[12]

State general appropriations	55.3%
Tuition and fees	16.8
Clinic income	11.5
Research grants (Sponsored)	10.9
Private gifts	4.2
Endowment income	1.0
Donated teaching service	0.3

The above percentages are for dental colleges that provide at least four years of dental education. Since the extensive use of the clinic for teaching does not occur until the junior year, a new dental college could not count upon the clinic as a major source of income until the third or fourth year of operation. Nor could a new dental college anticipate income in the form of research grants until its program was well established. Therefore, until the dental program becomes well established, its major sources of income would likely be (1) state appropriations, and (2) tuition and fees.

Since the above percentages include income from "Research Grants," and because the projected operating budget for the proposed new dental college (Page 25) did not include this item, it has been necessary to interpolate in arriving at an estimate of the amount of state appropriations needed for the current operating

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[12]Mann, William R.; Peterson, Shailer; Miller, Ben F.; "Financing and Expanding Dental Education," Journal of the American Dental Association, 62:65-76, (January, 1961).

budget. It was also necessary to make an assumption with regard to the amount of tuition and fees that might be required of resident students. Assuming that the annual tuition and fees would be $500, approximately 87 per cent of the annual budget for each of the first two years of operation would need to come from state appropriations. After the clinic becomes operable, this proportion would drop to about 62 per cent (this excludes research grants since the operating budget projections presented herein exclude this cost).

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Part V

SUMMARY

On the basis of the assumptions set forth in this report, it is estimated that 200,000 square feet of building space would be needed to accommodate a four-year undergraduate dental program with an enrollment of 228 students. Assuming that construction costs would be $30 per square foot, the total cost of the building or buildings will be $6,000,000. It is estimated that an additional $1,800,000 would be needed for equipment and furniture for the dental school. Thus, the total estimated cost for buildings and equipment (exclusive of site and planning services) would be $7,800,000.

Assuming that operating costs of the dental program in Oklahoma would approximate the operating costs of publicly supported dental schools across the nation, the operating budget for the first academic year would be $235,000. This figure, while it is based on the assumption that per-student costs will exceed the 1959-60 average by 15 per cent, is considered to be conservative. Annual operating costs would increase to about $895,000 by the fourth year.

Until the dental program becomes well established, about 87 per cent of annual operating costs would need to be provided through state appropriations. As the clinics become operable and income from other sources (such as research grants, private gifts, and the like) becomes available, the proportion of the budget required from state sources would drop to about 62 per cent.